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On the Equations of Motion of Crystal Dislocations

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Abstract

It is shown that when a Burgers screw dislocation moves with velocity v it suffers a longitudinal contraction by the factor $(1 - v^2/c^2)^{½}$, where c is the velocity of transverse sound. The total energy of the moving dislocation is given by the formula $E=E_0/(1 - v^2/c^2)^{½}$, where E_0 is the potential energy of the dislocation at rest. Taylor dislocations behave in a qualitatively similar manner, complicated by the fact that both longitudinal and transverse displacements and sound velocities are involved.

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